

Application No. 10/709,351

Reply to Office Action of March 8, 2006

REMARKS

Claims 1-14 and 17-22 are pending in the application. Claims 15 and 16 have been cancelled. Claim 1 has been amended to clarify that the carrier processor processes data received by the carrier radio frequency transceiver. Support for this amendment is found at least in Fig. 1, which illustrates a remote modem or transceiver 220 operatively coupled to a controller or processor 210 of carrier 200. Claim 2 has been amended to clarify that the extended conductor transmits to multiple antennas. That is, as claim 1 recites multiple material carriers, and as each material carrier is provided with its own antenna, and as the extended conductor transmits to each carrier antenna, the extended conductor thus transmits to multiple antennas. Support for this amendment is found at least in original claim 1 and in Fig. 1, which recite and illustrate, respectively, each carrier 200 having its own antenna 205. Claims 13 and 17 have been amended to address antecedent basis issues. Claims 18-20 have been amended to comport with standard U.S. patent practice, and in particular to recite that the claimed method comprises steps. Claim 18 has been further amended for consistent antecedent basis (providing both "a set of at least two material carriers" and "a master controller"). Claim 18 has still further been amended to comport with the rules of standard English grammar. Similar to the amendment of claim 1, claim 18 has yet further been amended to clarify that the carrier processor processes data received by the carrier radio frequency transceiver. New claims 21 and 22 have been added. Support for new claims 21 and 22 is found in the original specification, as is discussed further herein below. No new matter has been added by the foregoing amendments.

Claim Rejection – 35 U.S.C. § 112

Claim 2 has been rejected under 35 U.S.C. 112, second paragraph, as being indefinite. The Examiner states that the recited feature of claim 2 of "a coaxial cable having RF leakage along its length sufficient to transmit to said antenna" is not readily understood. The rejection is respectfully traversed.

At page 4, third paragraph, the specification discloses that "[y]et another feature [of the present invention] is the use of feeder cable (twin lead or leaky coaxial cable 75-300 ohms) for short range coupling and omni-directional antennas to enable communication in a noisy environment." (Emphasis added). Further, in describing a preferred embodiment of the present

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invention beginning at the final paragraph at page 9 and continuing to the top of page 10, the specification discloses:

Antenna design and implementation were found [to] have a significant effect on reliable communication. The location and combination of both omni-directional and leaky coax antennas were also significant. There is an omni-directional antenna on the side of each vehicle which is approximately 6 inches from the leaky coaxial cable located around the perimeter of each bay. Various bays were equipped with omni antennas located at strategic locations (determined empirically) in the bay to improve communication, so that there were two RF links in such bays – the link through the extended conductor and a direct link over the air interface between the two omni antennas. (Emphasis added.)

Applicants respectfully submit that original claim 2 is definite and particularly points out and distinctly claims the subject matter which the Applicants regard as the invention. In view of the specification, the person of ordinary skill in the art would readily understand that the feature recited in claim 2 of “a coaxial cable having RF leakage along its length sufficient to transmit to said antenna” refers to an electrically conductive coaxial cable from which a radio frequency signal is emitted at a power level sufficient to establish communication with a nearby antenna (preferably an omni-directional antenna). Applicants respectfully submit that claim 2 is in full compliance with the requirements of 35 U.S.C. § 112, second paragraph, and request that rejection of claim 2 under 35 U.S.C. § 112, second paragraph be withdrawn.

Claim Rejection – 35 U.S.C. § 102 – claims 1-4, 7-14, and 17-19

The Examiner has rejected claims 1-4, 7-14, and 17-19 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,912,644 (Wang). The Examiner asserts that Wang discloses a system and a method for controlling a set of material carriers under control of a master controller. In particular, the Examiner asserts that Wang discloses a set of at least two material carriers (6 and 7) having a spread spectrum RF transceiver; at least one master controller unit (1) having a spread spectrum RF transceiver in which communication between the controller and the set of carriers passes through a link comprising an extended conductor connected to the controller and an antenna (101) connected to each carrier. Applicants respectfully traverse these rejections.

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Wang discloses a spread spectrum wireless system providing multiple functions of position determination, ranging, and communications. In particular, Wang discloses a system consisting of hand-carried (or otherwise mobile) apparatuses (6, 7); fixed-position reference stations (2-5) deployed throughout an operating region; and a central reference station (1). Each mobile apparatus (6, 7) includes a spread spectrum transceiver, and, preferably, two man-machine interfaces (an input unit and an output unit). The system is capable of performing four functions: a) determination of the position of the mobile apparatuses (6,7) within the operating region (both absolute position and position relative to pre-defined features within the operating region); b) providing voice communication between mobile apparatuses, or between a mobile apparatus and the central station; c) transfer of data between mobile apparatuses or between a mobile apparatus and the central station; and d) display of stored information and storage of information entered by the user. See Wang: Abstract; column 7, line 47 – column 10, line 46; and Fig. 1. Wang discloses that the wireless system may be used in operating regions such as golf courses or ski resorts. See Wang: column 1, lines 6-8; column 7, lines 13-20; and column 31, lines 18-28.

Independent claim 1 is directed to a system for controlling a set of material carriers under control of a master controller, and, as amended, recites *inter alia*:

...
a set of at least two material carriers having a spread spectrum RF transceiver,
at least one master controller unit having a spread spectrum RF transceiver; in which communication between said controller and said set of carriers passes through a link comprising an extended conductor connected to said controller and an antenna connected to each carrier; and
each carrier contains a carrier processor for processing data received by said carrier RF transceiver. (Emphasis added.)

Independent claim 18 is directed to a method of exchanging data between a set of material carriers under the control of a master controller, and, as amended, similarly recites, *inter alia*:

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providing a set of at least two material carriers having a spread spectrum RF transceiver;
providing a master controller unit having a spread spectrum RF transceiver;
communicating between said controller and said set of carriers through a link comprising an extended conductor connected to said controller and an antenna connected to each carrier; and
processing, in each carrier, data received by said carrier RF transceiver. (Emphasis added.)

Wang fails to disclose at least the features recited in claims 1 and 18 of: (1) a set of at least two material carriers; (2) a master controller unit; and (3) a communications link comprising an extended conductor connected to the controller.

The Examiner has relied upon the mobile apparatuses 6, 7 of Wang to disclose the recited feature of a set of at least two material carriers. An ordinary meaning of the word "material" is "the substance or substances out of which a thing is or can be made". *The American Heritage College Dictionary*, 3rd Edition, Houghton Mifflin Company, 1993, page 837. An ordinary meaning of the word "carrier" is "a mechanism or device by which something is conveyed or conducted". *Id.*, page 215. Thus, a "material carrier" is a mechanism by which substances used to manufacture products are conveyed. This ordinary meaning of the term "material carrier" is consistent with the disclosure of the specification. For example, under the heading "Technical Field", at page 1 the specification discloses that "[t]he field of the invention is that of RF communication between a controller and a set of autonomous automated vehicles transporting materials within a building or other location; in particular transporting a load along a track in a remotely controlled vehicle."

The mobile apparatuses 6, 7 disclosed by Wang are not "automated vehicles used to transport materials within a building or other location". The mobile apparatuses 6, 7 are electronic communication devices (preferably sufficiently compact to be hand carried), and are utterly unrelated to automated vehicles used to transport materials within a building. The person of ordinary skill in the art would immediately recognize that the mobile apparatuses 6, 7 of Wang do not disclose the "material carriers" recited in claims 1 and 18.

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The Examiner has further relied upon the central station 1 of Wang to disclose the recited feature of a "master controller unit". An ordinary meaning of the word "master" is "one that has control over another or others". *Id.*, page 835. An ordinary meaning of the word "controller" is "one that controls". *Id.*, page 303. An ordinary meaning of the word "control" is "to exercise authoritative or dominating influence over; direct". *Id.*, page 303. Thus, a "master controller" is a single device capable of directing operation of other devices. Again, the ordinary meaning of the term "master controller" is consistent with the disclosure of the specification. At page 1, under the heading "Background of the Invention", the specification discloses that "[i]n the field of material transport through automated vehicles, it is necessary for a controller to communicate with individual ones of the vehicles to tell it to start, follow a certain part to a destination and to unload."

The central station 1 is not a "controller" which "regulates" or "controls" any other component of the wireless system of Wang. The central station 1 is disclosed to communicate data via wireless signals with the reference stations 2-5 and the mobile apparatuses 6, 7. Applicants further note that even if it were to be argued that the transfer of data discloses a "control" or "regulatory" function, Wang discloses that either the central station 1 or the reference stations 2-5 or the mobile apparatuses 6, 7 can initiate data transfer via the wireless signal. See Wang, column 12, lines 31-63. Thus, under this argument, Wang would disclose multiple "controllers", and would not disclose a single "master controller", as is recited in claims 1 and 18.

Still further, the Examiner has not specified which element of Wang discloses the feature recited in claims 1 and 18 of a communications link comprising an extended conductor connected to a controller. Wang discloses that each spread spectrum transceiver includes an antenna 101 (see column 20, lines 18-41 and Figs. 7 and 10). Wang is silent regarding the characteristics of the antenna 101, and does not disclose a communications link including an extended conductor connected to a controller.

Wang fails to disclose each and every feature of claim 1 (as well as claims 2-4, 7-14, and 17 depending from claim 1) and of claim 18 (as well as claims 18 and 19 depending from claim

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18). Accordingly, it is respectfully requested that the rejection of claims 1-4, 7-14, and 17-19 under 35 U.S.C. § 102(b) be withdrawn.

Claim Rejection – 35 U.S.C. § 103 – claims 2, 5, 6, 15-17, and 20

The Examiner has rejected claims 2, 5, 6, 15-17, and 20 under 35 U.S.C. § 103(a) as being unpatentable over Wang in view of U.S. Patent No. 6,204,813 (Wadell *et al.*, hereinafter “Wadell”). The Examiner admits that Wang fails to disclose the features of a coaxial cable having RF leakage along its length sufficient to transmit to an antenna and processing of material carrier location signals to determine whether two carriers are subject to a collision. The Examiner relies upon Wadell to disclose control of a carrier under the control of a master controller to calculate whether a carrier is subject to a collision with a nearby carrier. In particular, the Examiner relies upon disclosure of Wadell including the statement “[t]he present invention is also useful for collision avoidance systems and automated vehicle systems.” The Examiner asserts that it would have been obvious to one of ordinary skill to modify the wireless system of Wang to include the collision avoidance system disclosed by Wadell for safety. Applicants respectfully traverse rejection of claims 2, 5, 6, 17, and 20. Rejection of claims 15 and 16 is moot in view of cancellation of these claims.

Wadell discloses a radio frequency positioning or tracking system 10 that operates to identify and track the position of multiple objects. The tracking system 10 includes at least three tower transceivers 12, each of which has a processor 13 and an antenna 14. The tower transceivers 12 are positioned to surround a local area (such as a playing field). An object transceiver 16 is attached to each object being tracked. Each object transceiver 16 is electrically coupled to an antenna 18. A processor 20 is coupled to each object transceiver 16. Each tower transceiver 12 is coupled to a central processor 22 by a network 23. See Wadell, column 5, line 44 through column 6, line 54 and Fig. 1.

When making a rejection under 35 U.S.C. § 103, the Examiner has the burden of establishing a *prima facie* case of obviousness. The Examiner satisfies this burden only by showing (1) some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify or combine the

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references, (2) a reasonable expectation of success and (3) the prior art references much teach or suggest all of the claim limitations (see MPEP 706.02(j)). The teaching or suggestion to make the claim combination and reasonable expectation of success must be found in the prior art and not from the applicant's disclosure (see MPEP 706.02(j)). Further, the mere fact that the prior art could be modified in the manner proposed by the Examiner, does not make the modification obvious unless the prior art suggests the desirability of the modification. *Ex parte Dussaud*, 7 U.S.P.Q. 2d 181, 1820 (PTO Bd. App. & Int. 1988).

Wadell and Wang are not properly combinable under 35 U.S.C. § 103(a). Wadell broadly discloses incorporation of the radio frequency tracking system 10 into "collision avoidance systems and automated vehicle systems". Wang discloses a spread spectrum wireless system providing multiple functions of position determination, ranging, and communications. Having the disclosures of Wadell and Wang before him or her, the person of ordinary skill would fail to recognize any teaching, disclosure, or suggestion to combine the radio frequency tracking system 10 of Wadell (incorporated into a collision avoidance system or an automated vehicle system) with the spread spectrum wireless system of Wang. The Examiner asserts that the artisan would be motivated to make the proposed combination for the purpose of improving the safety of the system of Wang, by preventing collisions of material carriers. However, it is transparently clear that the artisan would not be concerned with the possibility of collisions between the hand-held apparatuses 6 and 7. Wang does not disclose the apparatuses 6, 7 to be capable of movement independently from a user. Thus, any collision of apparatuses 6, 7 would be the result of the user knocking the apparatuses 6, 7 together. Collision of apparatuses 6 and 7 does not occur in normal operation of the system of Wang. Applicants respectfully submit that the artisan would immediately recognize that the Examiner's proposal to calculate whether the apparatuses 6 and 7 are on a collision path would be pointless, would not enhance the functionality of the system of Wang, and would only increase the cost and complexity of the system of Wang without any benefit.

Even assuming *arguendo* that Wadell is properly combinable with Wang, Wadell and Wang, both in the proposed combination and individually, fail to disclose at least the features recited in claims 1 and 18, as amended, of a system for controlling a set of material carriers

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under the control of a master controller having (1) two material carriers; (2) a master controller unit; and (3) a communication link comprising an extended conductor connected to the controller. Wadell merely discloses use of the radio frequency tracking system 10 into "collision avoidance systems and automated vehicle systems". The Examiner has not relied upon Wadell to disclose, nor does Wadell disclose, the above-identified features recited in claims 1 and 18.

With respect to the feature recited in claim 2, as amended, of "a coaxial cable having RF leakage along its length sufficient to transmit to said antennas", the Examiner asserts that it has not been shown (1) why any leakage is necessary or (2) whether such leakage has solved any stated problem in the RF transmission art. As discussed above relative to the rejection of claim 2 under 35 U.S.C. § 112, the specification clearly discloses that the RF leakage allows the master controller unit to establish communication with the carrier processor via the electrically conductive cable and the carrier antenna. The short range (6 inches in a preferred embodiment) coupling of the coaxial cable and the carrier antenna promotes effective communication in a noisy environment. Thus, relative to the Examiner's question (1), RF leakage is necessary to establish communication between the controller and the carrier, and relative to the Examiner's question (2), the level of leakage and arrangement of the coaxial cable relative to the carrier antennas solves the problem of maintaining effective communication in a noisy environment.

Applicants respectfully disagree with the Examiner's assertion that "[o]verall, the above combination is close enough that one skilled artisan would have expected the same end result." It is transparently clear that (1) the feature of "a coaxial cable having RF leakage along its length sufficient to transmit" to nearby antennas is not disclosed by the cited prior art and (2) that this feature provides an end result (improved communication in a noisy environment) which would not be obvious to the artisan having Wadell and Wang before him or her.

Neither combination nor modification of Wadell and Wang is taught or suggested by the prior art. Even if combined, the proposed combination would fail to teach, disclose or suggest all of the elements of claims 1 and 18, and thus all of the elements of claims 2, 5, 6, and 17 depending from claim 1 and of claim 20 depending from claim 18. It is therefore respectfully submitted that a *prima facie* case for obviousness has not been established with respect to claims

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2, 5, 6, 17, and 20. Accordingly, it is respectfully requested that the rejection of claims 2, 5, 6, 17, and 20 under 35 U.S.C. § 103(a) be withdrawn.

New Claims 21 and 22

Applicants have added new independent claim 21 and new dependent claim 22. Support for new claim 21 is found in the original specification, at least beginning with the final paragraph at page 4 and continuing through the first full paragraph at page 8, as well as in the original drawings, Figs. 1-3. Support for new claim 22 is also found in the original specification at least beginning with the final paragraph at page 4 and continuing through the first full paragraph at page 8, as well as beginning with the final paragraph at page 9 continuing to the top of page 10, and also in the original drawings, Figs. 1-3. Applicants submit that new claims 21 and 22 are allowable over the prior art of record. Accordingly, Applicants respectfully request allowance of new claims 21 and 22.

CONCLUSION

In view of the foregoing amendment and remarks, Applicants respectfully submit that the present application, including claims 1-14 and 17-22, is in condition for allowance, and such action is respectfully requested.

Respectfully submitted,

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